
Executive Summary

The Federal Radionavigation Plan (FRP) delineates policies and plans for Federally provided radionavigation services. It also recognizes that the existence of privately operated radiodetermination systems may impact future government radionavigation planning. This plan describes areas of authority and responsibility and provides a management structure by which the individual operating agencies can define and meet radionavigation requirements in a cost-effective manner. It is the official source of radionavigation policy and planning for the Federal Government. This edition of the FRP updates and replaces the 1992 FRP and incorporates common-use radionavigation systems (i.e., systems used by both civil and military sectors) covered in the Department of Defense (DOD) Chairman, Joint Chiefs of Staff (CJCS) Master Navigation Plan (MNP). The MNP covers many radionavigation systems used exclusively by the military, and has not been superseded by the FRP.

This document describes the various phases of navigation and other applications of radionavigation services, and provides current and anticipated requirements for each. As requirements change, radionavigation systems may be added or deleted in subsequent revisions to this plan.

The FRP covers common-use, Federally operated systems. These systems are sometimes used in combination or with other systems. Privately operated systems are recognized in the interest of providing a complete picture of U.S. radionavigation.

The systems covered in this plan are:

- ◆ GPS
- ◆ Augmentations to GPS
- ◆ Loran-C

- ◆ Omega
- ◆ VOR and VOR/DME
- ◆ TACAN
- ◆ ILS
- ◆ MLS
- ◆ Transit
- ◆ Radiobeacons
- ◆ Vessel Traffic Services

Augmentations to GPS, such as differential GPS (DGPS), are enhancements to the GPS system. Because of their unique characteristics, these augmented systems are addressed separately in this document. Vessel Traffic Services (VTS) are also discussed, because DGPS is an essential component of the system being installed at Valdez, Alaska, and has the potential for application in future VTS.

A major goal of DOD and the Department of Transportation (DOT) is to select a mix of these common-use (civil and military) systems which meets diverse user requirements for accuracy, reliability, availability, integrity, coverage, operational utility, and cost; provides adequate capability for future growth; and eliminates unnecessary duplication of services. Selecting a future radionavigation systems mix is a complex task, since user requirements vary widely and change with time. While all users require services that are safe, readily available and easy to use, military requirements stress unique defense capabilities, such as performance under intentional interference, operations in high-performance vehicles, worldwide coverage, and operational capability in severe environmental conditions. Cost remains a major consideration which must be balanced with a needed operational capability.

Navigation requirements range from those for small single-engine aircraft or small vessels, which are cost-sensitive and may require only minimal capability, to those for highly sophisticated users, such as airlines or large vessel operators, to whom accuracy, flexibility, and availability may be more important than initial cost. The selection of an optimum mix to satisfy user needs, while holding the number of systems and costs to a minimum, involves complex operational, technical, institutional, international and economic trade-offs. This plan establishes a means to address user inputs and questions, and arrive at an optimum mix determination. This edition of the FRP builds on the foundation laid by previous editions and further develops national plans toward providing an optimum mix of radionavigation systems. The constantly changing radionavigation user profile and rapid advancements in systems technology require that the FRP remain as dynamic as the

issues it addresses. This issue of the FRP contains the current policy on the radionavigation systems mix.

This document is composed of the following sections:

Section 1 - Introduction to the Federal Radionavigation Plan: Delineates the purpose, scope and objectives of the plan, presents the DOD and DOT authority and responsibilities for providing radionavigation services, and describes the DOD and DOT policies and plans for the radionavigation system mix.

Section 2 - Radionavigation System User Requirements: Provides civil and military requirements for air, space, land, and marine navigation, and positioning and timing applications.

Section 3 - Radionavigation System Use: Describes how the various radionavigation systems are used in meeting civil requirements, and the status and plans for each system.

Section 4 - Radionavigation System Research, Engineering and Development Summary: Presents the research, engineering, and development efforts planned and conducted by DOT, DOD, and other Federal organizations.

Appendix A - System Descriptions: Describes present and planned navigation systems in terms of ten major parameters: signal characteristics, accuracy, availability, coverage, reliability, fix rate, fix dimensions, system capacity, ambiguity, and integrity.

Appendix B - Reference Systems: Discusses geodetic datums and the reference systems based upon them.

Appendix C - Definitions

Appendix D - Glossary

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